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US 4338941 A US 3516407 A

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(54) Inflatable intranasal packing device

(57) A balloon packing 3 for a nasal cavity is made of a flexible inelastic material and when inflated is larger than but of the same shape as the nasal cavity. When inflated in the nasal cavity it fills the whole cavity and applies a pressure to it which is substantially equal to the inflation pressure allowing controlled pressure nasal packing throughout the nasal cavity resulting in increased efficacy in for example the treatment of nasal bleeding. A valve 2 allows inflation to various pressures and an introducer 1 facilitates insertion and correct orientation in the nasal cavity.

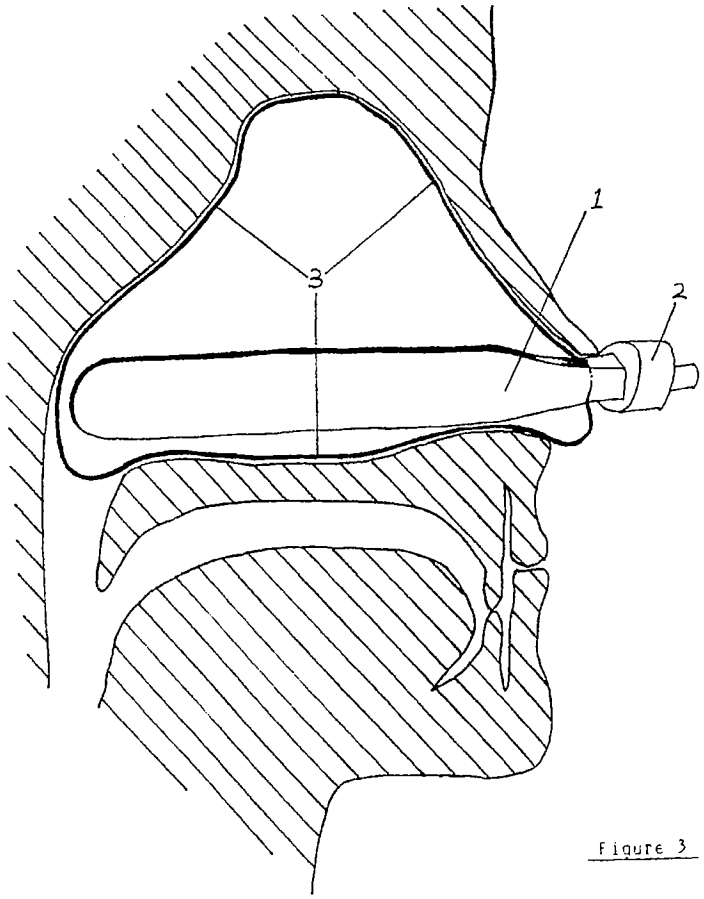

Figure 3

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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Figure 1

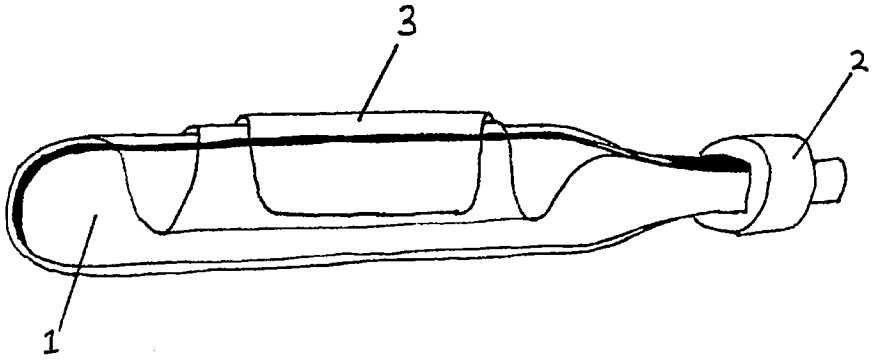


Figure 2

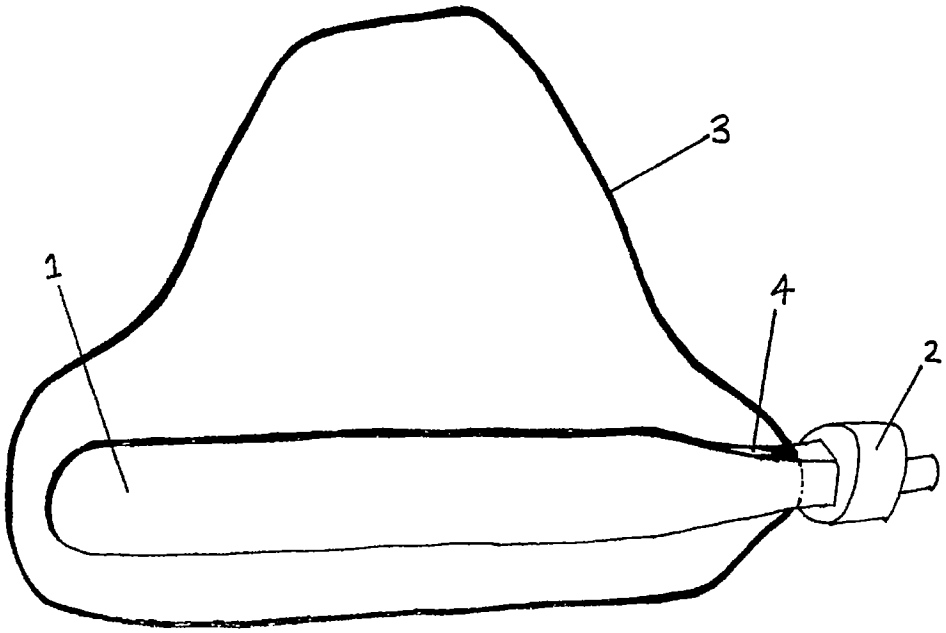
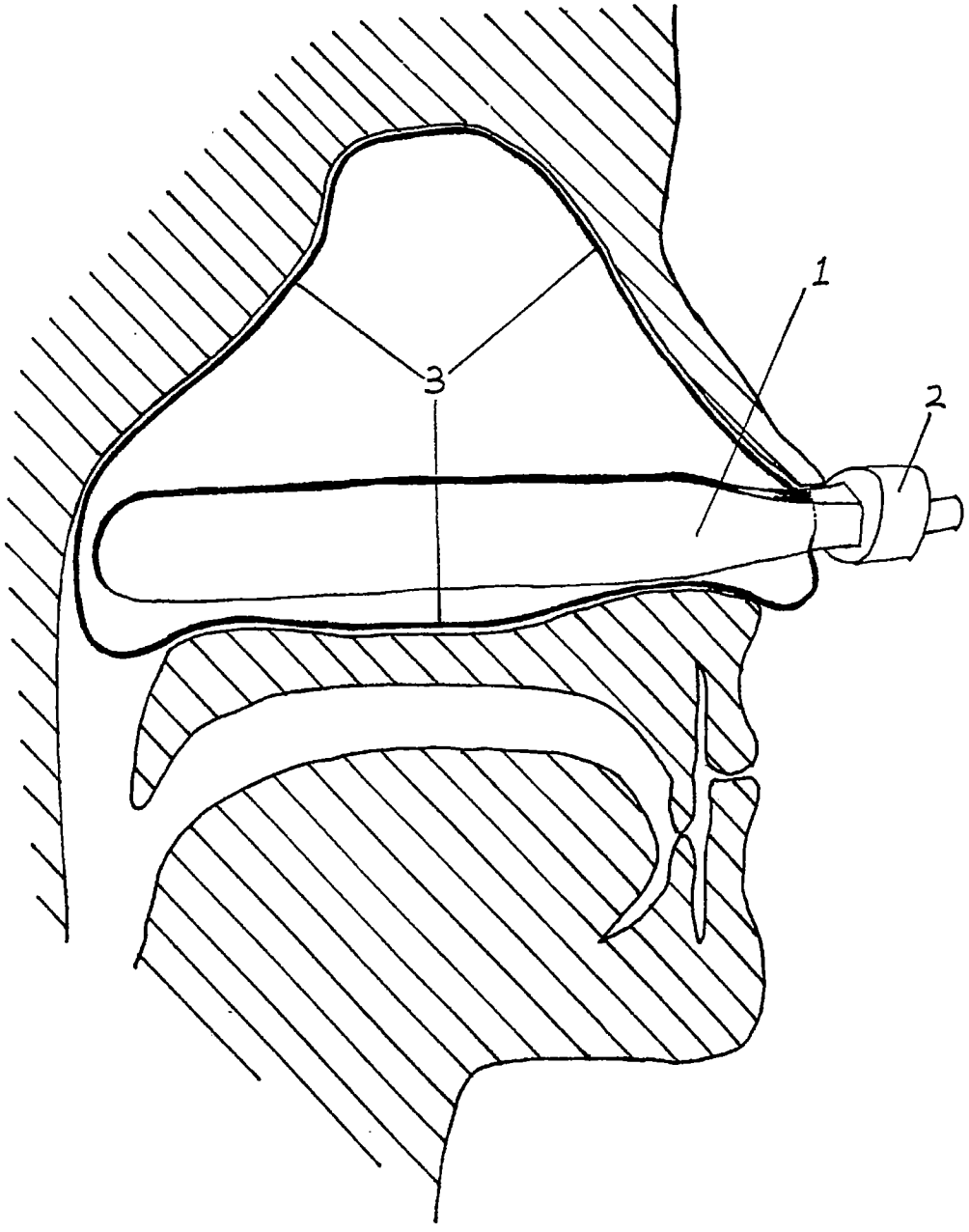


Figure 3



CONTROLLED PRESSURE INTRANASAL PACKING DEVICE

This invention relates to a balloon device for the production of controlled pressure packing within the nasal cavity and more particularly concerns the use of this device for the control of nasal bleeding and for post operative nasal packing.

The nasal cavity is an air filled space which extends from the nasopharynx posteriorly to the nostrils anteriorly and is divided vertically into right and left sides by the nasal septum.

Occasions often arise when pressure must be applied within the nasal cavity. These include the treatment of nasal bleeding and collections of fluid within the septum as well as for patients who have undergone nasal surgery.

Pressure is usually applied by the use of two main types of packing methods. Firstly there are those involving the insertion into the nasal cavity of flexible materials such as ribbon gauze or sponge either directly or wrapped in a waterproof sheath. Secondly there are packing methods involving the inflation of elastic balloons either within or at the entrance or exit to the nasal cavity.

Gauze and sponge packs often do not reach the desired point in the nose. They also apply uneven and uncontrolled pressure and may be difficult and uncomfortable to insert.

All current balloon packs have a shape which is largely constrained by the tension or rigidity of their walls. The pressure which an elastic balloon exerts at a point in the nasal cavity is dependent on the local tension and radius of curvature of its walls. This tension also prevents contact with some of the nasal cavity by constraining the shape of the balloon when inflated. These factors lead to uneven and uncontrolled application of pressure by current balloon packs.

The limitations of current packing techniques lead to a number of problems. The most troublesome of these is failure to arrest nasal bleeding but the formation of pressure ulcers in the nose, the inhalation of loose packs, difficulty of insertion and painful removal of packs must all be considered.

According to the present invention there is provided a non elastic balloon which is of the same shape as one side of the nasal cavity but greater than it in width and height and length such that when inflated within the nasal cavity it expands to assume the shape of the cavity largely without constraint of wall tension save at the entrance and exit of the cavity where some longitudinal wall tension prevents egression of the balloon. Reasonable means of introducing the deflated balloon into the nostril are provided. A valve mechanism is attatched to the balloon and projects from the nostril for the purpose of inflation to various pressures, deflation and removal of the balloon following use. Due to the lack of any significant wall tension and the tendency of the tension to be orthogonal to balloon air pressure within the nasal cavity as a consequence of the box like shape of the cavity, balloon air pressure is applied to almost all of the nasal cavity without any reduction due to wall tension, providing controlled pressure nasal packing.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawing in which:-

Figure 1 Shows a deflated balloon collapsed onto a flexible introducer;

Figure 2 Shows the balloon inflated to its full extent in free conditions and

Figure 3 Shows the balloon inflated within one half of the nasal cavity in cross section.

Referring to the drawing the device consists of a suitable flexible non distensible material such as polyethylene in the form of a balloon 3. This balloon is so constructed as to be larger than one half of the nasal cavity when inflated as shown in figure 2, but of the same overall shape. The balloon is introduced into the nose through one nostril by reasonable means, in figure 1 it is shown collapsed onto a flexible introducer 1 which may be pushed into the nose carrying the balloon with it. The balloon is then inflated with air through a valve 2 which is in this example already attatched and sealed to the balloon and introducer and communicates with the balloon through an air port 4 such that after inflation to a desired pressure by a suitable pump and pressure meter the valve prevents leakage of air and the balloon pressure is maintained. A suitable device may be attatched to the valve to monitor balloon pressure after inflation to indicate a need for adjustments in pressure. On inflation the balloon takes up the shape of and applies pressure to the whole of the nasal cavity as shown in figure 3. After use the balloon is deflated and withdrawn through the nostril.

It is to be understood that the form of the invention herewith described is only a preferred embodiment. Various changes may be made in shape, size and arrangement of component parts for example. Equivalent elements may be substituted for those illustrated and described, certain features of the invention may be utilised independently of the the use of other features all without departing from the scope of the invention as will be described and defined in the claims.

Claims

1. A nasal balloon pack made from a flexible non distensible material which is larger in dimension but of the same overall shape as a nasal cavity such that on insertion through the nostril and inflation it expands to fill the whole nasal cavity without constraint of walltension save that longitudinal tension preventing egress of the pack from the front or the back of the cavity in order that the pressure applied to the nasal cavity by the pack is effectively equal to the inflation pressure allowing direct control of the pressure applied to the nasal cavity by varying the known inflation pressure.

2. A nasal balloon pack as claimed in claim 1 with a valve attached anteriorly for the purpose of inflation and deflation to various pressures where the valve assembly projects from the nostril when the pack is in position and where following inflation or deflation the valve prevents air leakage and maintains balloon pressure.

3. A nasal balloon pack as claimed in any preceding claim where a device for indicating pressure in the balloon is left attached after inflation.

4. A nasal balloon pack as claimed in any preceding claim where a relatively rigid object is present within the balloon in order to act as an introducer and or a means of orientation into the nasal cavity.

5. A nasal balloon pack substantially as described herein with reference to figures 1 to 3 of the accompanying drawing.